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ANTHROPOMETRIC STUDY OF U.S. ARMY NATIONAL GUARD PERSONNEL, FORT POLK, LOUISIANA (2003)

by
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Final Report
July 2003 – November 2004

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Natick, Massachusetts 01760-5020

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14. ABSTRACT
This report highlights the collection of anthropometric and demographic data for a group of Army National Guard (ARNG) personnel (N=451) who were preparing, at Fort Polk, Louisiana for active duty in Bosnia and Kosovo in July 2003. These data provide information on body size and shape for Army National Guard personnel. In addition, this report, the first of its kind, provides weights(grams) from a post-hoc study of warm weather and temperate Battle Dress Uniforms (BDUs), T-shirts and socks. Data from this new ARNG study are compared with data from active duty soldiers from an earlier study, the 1988 Anthropometric Survey of U.S. Army Personnel: Methods and Summary Statistics (Gordon et al., 1989)(ANSUR), in order to assess differences between these two groups. Results indicate that white males from the ARNG group were, on average, shorter and heavier with larger waist circumferences and larger Body Mass Index (BMI) values than their active duty counterparts. A number of these differences were statistically significant.

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PREFACE

This report highlights the collection of anthropometric and demographic data for a group of Army National Guard personnel (N=451) who were preparing at Fort Polk, Louisiana for active duty in Bosnia and Kosovo, July 2003. These data provide information on body size and shape for Army National Guard personnel. In addition, this report, the first of its kind, provides weights (grams) from a post-hoc study of warm weather and temperate Battle Dress Uniforms (BDUs), T-shirts and socks. The work was performed during the period July 2003 – November 2004 under project number 423012.30.

Data from this new Army National Guard study are compared with data from active duty soldiers from an earlier study, the *1988 Anthropometric Survey of U.S. Army Personnel: Methods and Summary Statistics* (Gordon et al., 1989) (ANSUR), in order to assess differences between these two groups. The use of copyright-protected products in this report does not imply an official endorsement of the product or item.

The authors acknowledge ANTHROTECH, the anthropometric data collection company located in Yellow Springs, Ohio, for their services in assisting in the collection and entering the original data. We thank Mr. Tom Theaux, Joint Readiness Training Center, Operations Group (JRTC OPS GRP), whose tireless efforts, from setting up access to the soldiers to briefing them on the project during the period of data collection, were invaluable for the completion of this study. Finally, we appreciate the patience and help received from those soldiers who participated in this study. Thank you, all.

ANTHROPOMETRIC STUDY OF U. S. ARMY NATIONAL GUARD PERSONNEL, FORT POLK, LOUISIANA (2003)

Introduction

The knowledge of body-size distributions is critical for the design and sizing of life-saving clothing and equipment in the military and civilian first-responder occupations, such as police work and firefighting. Many factors, including variation in age, sex, racial/ethnic composition, secular trends, and changing fitness and body fat standards influence the body size distributions of these occupational groups (Gordon & Friedl, 1994).

The Army National Guard (ARNG) and Army Reserve (AR) forces in combination comprise more than half of the U.S. Army and their demographic compositions are significantly different from the active duty forces (Defense Manpower Data Center (DMDC), 2003). For these reasons, body-size distributions may also differ significantly. Critical shortages of protective clothing and equipment in larger sizes during ARNG deployment to Iraq in 2003 provided strong indications that ARNG personnel are indeed larger and heavier than their active duty counterparts (Gordon, 2003). However, it was not until recently that basic anthropometric data on National Guard forces became available to test this hypothesis.

The data reported here are part of an ongoing survey to measure National Guard/Reserve and active duty forces during periods of training at the Joint Readiness Training Center (JRTC) and during the processing of National Guard and Reserve units called up for active duty. This effort will provide continuing information for understanding body-size differences between these three components and how these differences impact clothing and equipment design and fit.

The primary goals of this research are threefold. Firstly, it provides both anthropometric and demographic distributions for soldiers in an Army National Guard group that up until now have been absent from the literature. Secondly, the data from this initial survey are compared to data currently available for active duty soldiers to test for statistically significant differences in body size between the two components. Lastly, subjects measured in this survey are screened using current Army and Department of Defense weight-for-height standards to determine the extent to which soldiers from the Army National Guard comply with these standards.

Materials and Methods

The data collected for analysis in this report are from Army National Guard forces that were preparing for a tour of active duty in Bosnia and Kosovo at Fort Polk, Louisiana. This group, comprised primarily of the 28th Infantry Division of the Pennsylvania ARNG, was processed at Fort Polk during July 1-3, 2003 (see Table A1). A data-collection team, comprised of the senior author and three technicians from ANTHROTECH, the anthropometric data collection company located in Yellow Springs, Ohio, collected stature, weight, waist circumference and other demographic data on soldiers while they were processing for deployment to Bosnia and Kosovo (see Table A2).

The Soldiers

The 451 test participants were selected at random from the 1547 soldiers who were processed between July 1 and July 3, 2003. Of the 451 soldiers measured, only six were female--too few from which to draw gender based conclusions. Therefore, these six females have been dropped from any further analysis. The subjects were briefed on the purpose of the study, asked to fill out a short demographic questionnaire (see Table A2), and to remove their footwear, Battle Dress Uniform (BDU) coats, belts and any items from their pockets. The individuals were then weighed and measured in only their BDU trousers, T-shirt and stocking feet. The soldiers were also asked a series of questions in order to establish their racial/ethnic backgrounds (see Table A2). When the subjects were finished, they collected their items, were thanked for their time and cooperation, and were returned to the head of the processing line.

Electronic Data Entry

On completing data collection at Fort Polk, the team from ANTHROTECH returned to Yellow Springs and entered the raw data into electronic format using Microsoft Excel©. They conducted a preliminary screening of the data for any measurement and data-entry errors. The database, initial data screening, and variable descriptions were sent to the senior author electronically. No changes were made to the database at that time. ANTHROTECH's descriptions of variables and initial data screening are presented in Appendix B, Table B1 and Appendix C, respectively. The Excel database was imported to Stata 8© for further data editing and analysis (StataCorp, 2003).

While conducting data cleaning, it became apparent to the ANTHROTECH team that there were 19 individuals that incorrectly gave their birth year as 2003, so their correct ages could not be calculated. These individuals were removed from all analyses. There was also one individual whose stature was inadvertently not recorded, and he was removed from any further analyses.

Clothing Weights

Due to the design and logistics of this study, data were collected with subjects dressed in their BDU trousers, brown colored T-shirts and stocking feet. They were requested to remove their BDU coats, boots, hats, belts and any items from their pockets. In order to make this sample of soldiers comparable to other Army anthropometric surveys, for which individuals wore less clothing, it was necessary to provide an adjustment of the Fort Polk subjects' weights that was representative of the weight of the clothes they were wearing at the time of measurement.

Initial research located published average weights for a temperate- and warm- weather BDU ensemble, T-shirt and socks (R. Lomba, per comm.). After some consideration, the authors felt that with the considerable variation in size distribution among BDUs and the fact that the Fort Polk sample was measured without including the BDU coat, a single average ensemble weight would not suffice. Therefore, a post-hoc study was conducted to collect the weights of BDU trousers, socks and T-shirts for each size category present in the study.

To provide more specific weight data for BDU trousers and coats, as well as for T-shirts, the authors weighed clothing items from the volunteer soldiers at the Natick Soldier Center. In addition, the clothing sales center at Fort Devens, MA, provided access to new BDU trousers, socks and T-shirts for nearly all size categories (see Table A4 and Table A5). These weights were imported into the Fort Polk database and subtracted from the actual subjects' weights to provide a better estimate of nude weight. There were 22 individuals whose clothing sizes were not available for weighing, primarily in the extra-small and extra large-sizes (see Table A4). These individuals were removed from any further analysis.

Data Editing

The team from ANTHROTECH completed an initial data check during data entry and forwarded their suggestions without conducting any changes to the original information. They identified four individuals whose reported heights were significantly different than their measured heights. These soldiers appear to have reported their heights in inches instead of feet and inches (i.e., reported 6'8" and meant 68"or 5'6", which corresponded with the actual measured height). These individuals remain in the database, as their measured data and not their reported data were analyzed. This underscores the importance of collecting measured data rather than self-reported data.

A total of 47 subjects were dropped from analysis for the following reasons: 1) missing data, 2) reporting an incorrect birth year, 3) too few subjects for analysis between sex and race, and 4) clothing sizes not available before weighing. A review of the summary statistics revealed that there were no extreme values that required further changes to the database. The final working database comprised 404 male ARNG soldiers who were measured at Fort Polk, Louisiana during the first week of July 2003.

Military Units Measured at Fort Polk

The distribution of military units for male ARNG soldiers who were measured at Fort Polk, Louisiana during July 2003 appears in Table A1. Of the 404 individuals studied, 354 or 88% were assigned to the 28th Infantry Division of the Pennsylvania ARNG. Forty-four (11%) of the 404 soldiers were assigned to other ARNG units, while one soldier of the 404 was assigned to the State Area Command (STARC). Five individuals did not provide their military units for analysis.

Distribution of Primary Military Occupational Specialties (MOS)

Table A3 in Appendix A provides a detailed description of primary Military Occupational Specialties (MOS) for male ARNG personnel who were measured at Fort Polk, Louisiana in July 2003. Table 1, below, is a compressed version of that table. Approximately 60% of the subjects in this study were classified as infantry soldiers. This was the largest group in the data set.

Table 1. *Distribution of MOS categories for male ARNG personnel, measured at Fort Polk, Louisiana, July 2003.*

MOS	Description	Total	MOS	Description	Total
11	***Infantry***	***241***	62	Construction	1
12	Combat Engineering	16	63	Mechanical Maintenance (vehicles)	7
13	Field Artillery	16	67	Aircraft Maintenance	6
14	Air Defense	1	71	Administration	1
15	Aviation	3	74	Information Systems	3
19	Armor	10	75	Personnel	6
21	Corps of Engineers	1	77	Fuels and Water	1
25	Visual Information	4	88	Transportation	1
27	Missiles System Maintenance	4	91	Medical	16
31	Signals Communication	6	92	Logistics	8
35	Electronic Maintenance	12	95	Law Enforcement	3
45	Armament Maintenance	1	96	Intelligence	15
54	Chemical Operations	2	97	Counterintelligence	3
55	Ammunition	1	98	Signals (Communications) Intelligence	3
56	Chaplain	4	153	Helicopter Pilot	8
Subtotal		**322**			**82**
Total Sample					**404**

Results

Demography

The overall age distribution of male ARNG personnel measured at Fort Polk during July of 2003 is presented in Table 2, and compared to the Army National Guard census for November 2003 (DMDC, 2003). The age distribution of the Fort Polk sample is similar to that of the ARNG, except for individuals in the 25 to 34 and the over-45 age groups (see age specific totals in Table 2). A binomial test of proportions shows that in the Fort Polk sample 25- to 34-year olds are overrepresented while the over-45 year-old age group is underrepresented. These differences are statistically significant ($p < 0.05$)(see Table 2).

The distribution of race/ethnicity for male ARNG personnel measured at Fort Polk, Louisiana during July of 2003 is also presented in Table 2 and compared to the Army National

Guard census for November 2003 (DMDC, 2003). Approximately 87% of the 404 male subjects measured at Fort Polk during July 2003 classified themselves as white while only 4% classified themselves as black. The ARNG census data from November 2003 (DMDC, 2003) indicate that white males were overrepresented and black males were underrepresented in the Fort Polk sample (see final row in Table 2). A binomial test of proportions between the two groups shows that these differences for white and black individuals are statistically significant ($p < 0.05$). In addition, these differences are statistically significant within all age groups ($p < 0.05$), except for black males in the over-45 age group (see Table 2).

Anthropometry

The distribution of average stature, weight, waist circumference, and Body Mass Index (BMI) data for males from the 2003 Fort Polk sample is presented in Table A6. Due to the small sample sizes and underrepresentation of minority race/ethnic groups, only those individuals who classified themselves as white, according to Federal Regulation, are reported in this analysis (Federal Register, 1978). The distribution of average stature, weight, waist circumference and BMI for white males from the 2003 Fort Polk sample is presented in Table 3. These are compared to the same data for white males, from the 1988 ANSUR database, detailed in Table 4. Table 4 also presents a 15-year adjustment of height, weight and BMI data for the 1988 active duty soldier data, employing secular trend models outlined by Greiner and Gordon (1992) to account for any secular changes among this group.

Prior to conducting any statistical analysis between the Fort Polk and ANSUR data, a test of variances between the groups was completed using robust tests for variance (ROBVAR) as outlined in Stata 8 (StataCorp, 2003). This analysis tests the hypothesis that the group variances are the same in both samples. If no statistically significant differences are present, then parametric tests can be employed. However, if statistical differences are present, then the use of nonparametric tests is warranted. No differences in the variance of stature measurements were found between the two groups and therefore stature differences were tested using parametric *t*-tests. On the other hand, variances for weight, waist circumference and BMI revealed statistical differences and therefore these variables were analyzed using non-parametric Wilcoxon Rank-Sum tests. A Bonferroni correction for four age-group comparisons was employed to reduce the chance of making a Type I error. In addition, results from the 1988 ANSUR database are

Table 2. *Age and race/ethnicity distribution for male ARNG sample, Fort Polk, Louisiana, July 2003, compared to the whole Army National Guard, 2003*

		Ft. Polk ARNG Sample July 2003		Army National Guard November 2003		
Age	**Race**	***n***	**(%)**	***n***	**(%)**	****p* - values**
<25	***White**	**109**	**(88.6)**	**70,370**	**(78.2)**	**($p < 0.05$)**
	***Black**	**3**	**(2.4)**	**10,168**	**(11.3)**	**($p < 0.05$)**
	Hispanic	5	(4.1)	3588	(4.0)	
	Asian/PI	2	(1.6)	1974	(2.2)	
	Native American	0	(0)	624	(0.7)	
	Other	4	(3.25)	3210	(3.6)	
	Total	**123**		**89,934**		
	(%)	**(30.4)**		**(30.0)**		
25-34	***White**	**116**	**(82.8)**	**67,124**	**(75.6)**	**($p < 0.05$)**
	***Black**	**7**	**(5.0)**	**10,567**		**(p <0.05)**
	Hispanic	9	(6.4)	4757	(5.4)	
	Asian/PI	4	(2.8)	1462	(1.6)	
	Native American	0	(0)	655	(0.7)	
	Other	4	(2.8)	4172	(4.7)	
	***Total**	**140**		**88,737**		**($p < 0.05$)**
	(%)	**(34.6)**		**(29.6)**		
35-44	***White**	**97**	**(88.2)**	**56,596**	**(72.3)**	**($p < 0.05$)**
	***Black**	**5**	**(4.5)**	**12,707**	**(16.2)**	**($p < 0.05$)**
	Hispanic	5	(4.5)	4551	(5.8)	
	Asian/PI	2	(1.8)	897	(1.1)	
	Native American	0	(0)	550	(0.7)	
	Other	1	(0.9)	2981	(3.8)	
	Total	**110**		**78,282**		
	(%)	**(27.2)**		**(26.1)**		
45+	***White**	**29**	**(93.5)**	**31,206**		**($p < 0.05$)**
	***Black**	1	(3.2)	6336	(14.8)	
	Hispanic	1	(3.2)	3158	(7.4)	
	Asian/PI	0	(0)	451	(1.0)	
	Native American	0	(0)	245	(0.6)	
	Other	0	(0)	1447	(3.4)	
	***Total**	**31**		**42,843**		**($p < 0.05$)**
	(%)	**(7.7)**		**(14.3)**		
Total	***White**	**351**	**(86.9)**	**225,296**	**(75.15)**	**($p < 0.05$)**
	***Black**	**16**	**(4.0)**	**39,778**	**(13.27)**	**($p < 0.05$)**
	Hispanic	20	(5.0)	16,054	(5.35)	
	Asian/PI	8	(2.0)	4784	(1.59)	
	Native American	0	(0)	2074	(0.69)	
	Other	9	(2.2)	11,810	(3.93)	
	Total	**404**		**299,796**		

approximately 15 years old and therefore the data are adjusted for 15 years of secular trend by incorporating the secular trend models developed by Greiner and Gordon (1992) into the analysis.

Table 3. *Distribution of anthropometric measurements for white males from a sample of ARNG, Fort Polk, Louisiana 2003*

Age	*n*	Variable	Min	Mean	*SD*	Max
<25	109	Height (mm)	1640.0	1771.2	60.97	1942.0
		Weight (kg)	57.4	82.9	12.50	117.2
		Waist Circumference (cm)[1]	71.5	88.7	8.75	110.0
		BMI (kg/m^2)	19.1	26.4	3.47	33.7
25-34	116	Height (mm)	1600.0	1757.5	64.74	1898.0
		Weight (kg)	56.0	84.7	12.36	124.3
		Waist Circumference (cm)	72.0	91.5	9.25	125.0
		BMI (kg/m^2)	20.1	27.4	3.67	39.8
35-44	97	Height (mm)	1570.0	1747.5	72.80	1945.0
		Weight (kg)	55.9	87.5	11.64	114.4
		Waist Circumference (cm)	74.0	95.9	8.75	116.0
		BMI (kg/m^2)	18.7	28.6	3.43	35.6
+45	29	Height (mm)	1574.0	1722.3	79.42	1860.0
		Weight (kg)	64.5	84.6	10.30	112.7
		Waist Circumference (cm)	80.5	95.2	6.72	107.0
		BMI (kg/m^2)	23.8	28.5	2.17	32.6
Total	**351**					

[1]Waist Circumference was measured at Omphalion

Distribution of Stature. The distribution of average stature (mm), by age, for white male ARNG personnel from Fort Polk, Louisiana during July 2003 is presented in Table 3 and may be compared to active duty data from white male subjects in the 1988 ANSUR database, adjusted for secular trends (Gordon et al., 1989) presented in Table 4. Results show that for both groups stature generally decreases with age. When compared, the ARNG personnel from the Fort Polk sample are, on average, shorter than their ANSUR counterparts at all ages except for those subjects under the age of 25 (see Tables 3 and 4). *T*-tests incorporating a Bonferroni correction found that the differences in stature were statistically significant between males in the three oldest age groups ($p < 0.05$)(see Table 5).

Distribution of Weight. The distribution of average weight (kgs), by age, for white male ARNG personnel from Fort Polk, Louisiana in July 2003 is presented in Table 3 and compared to white active duty males from the 1988 ANSUR database, adjusted for secular trends (Gordon et al., 1989) (see Table 4). Results suggest that weight generally increases with age for both groups (see Tables 3 and 4) and that white males from the Fort Polk sample are heavier at all ages than white male subjects from the ANSUR database except in the oldest age group. Employing a Wilcoxon Rank Sum test revealed statistically significant differences between males from all age groups except those in the 25 to 35 year old group ($p < 0.05$)(see Table 5).

Distribution of Waist Circumference. The distribution of waist circumference (cm) measured at omphalion, by age, for white male ARNG personnel from Fort Polk, Louisiana in July 2003 is presented in Table 3 and compared to white active duty males from the 1988 ANSUR database (Gordon et al., 1989) (see Table 4). Results suggest that waist circumference increases with age for both groups (see Tables 3 and 4) and that subjects from the Fort Polk sample have larger waist circumference measurements than their ANSUR counterparts in all age groups except those over 45 years of age. Wilcoxon Rank Sum tests revealed statistically significant differences in the three youngest age groups ($p < 0.05$)(see Table 5). Unfortunately, no secular trend models were available at this time to adjust waist circumference for the 15-year difference between the two studies; as a result, the unadjusted values for white males were compared.

Distribution of Body Mass Index. The distribution of Body Mass Index (BMI), by age, for white male ARNG personnel from Fort Polk, Louisiana in July of 2003 is presented in Table 3 and compared to white active duty males from the 1988 ANSUR database (Gordon et al., 1989) (see Table 4). Results suggest that average BMI increases with age for both groups and that males from the Fort Polk sample have larger BMI values in all age groups except those over forty-five years of age. Wilcoxon Rank Sum tests revealed that these differences are statistically significant in all but the oldest age group ($p < 0.05$)(see Table 5).

Table 4. *Distribution of anthropometric measurements for white active duty males from the 1988 ANSUR database*

			Unadjusted data				Secular Trend Adjustment*	
Age	***n***	**Measurement**	**Min**	**Mean**	***SD***	**Max**	**Mean**	***SD***
<25	813	Height (mm)	1560.0	1759.0	65.88	2042.0	1770.2	65.9
		Weight (kg)	49.8	76.4	9.75	124.3	80.5	9.8
		Waist Circumference (cm)[1]	68.4	84.3	7.54	115.3	-----	------
		BMI (kg/m^2)	17.9	24.7	2.67	35.3	25.7	2.6
25-34	555	Height (mm)	1497.0	1768.6	64.39	1954.0	1779.7	64.4
		Weight (kg)	54.5	79.7	10.93	112.8	83.8	10.9
		Waist Circumference (cm)	70.5	88.2	8.23	117.3	-----	------
		BMI (kg/m^2)	18.9	25.4	2.84	36.7	26.4	2.8
35-44	236	Height (mm)	1572.0	1761.2	64.82	1934.0	1772.3	64.8
		Weight (kg)	55.0	82.0	11.75	116.9	86.1	11.8
		Waist Circumference (cm)	70.7	92.3	8.56	118.5	-----	------
		BMI (kg/m^2)	18.5	26.5	3.07	34.7	27.4	3.0
45+	9	Height (mm)	1622.0	1770.0	71.06	1841.0	1781.1	71.1
		Weight (kg)	66.4	88.2	14.53	108.3	92.3	14.5
		Waist Circumference (cm)	81.4	97.1	7.94	107.4	-----	-----
		BMI (kg/m^2)	23.2	28.2	3.02	32.6	28.9	2.9
Total	**1613**							

* Secular Trend adjustments were made using Greiner and Gordon (1992) to adjust the 1988 active duty heights and weights to estimate 2003 values. Active-duty soldier BMI values were recalculated using the adjusted height and weight data. There was no secular trend model for waist circumference values; as a result, unadjusted values were used to compare the two groups.

[1]Waist Circumference was measured at omphalion.

Table 5. *Results for statistical comparison of white ARNG males from Fort Polk, Louisiana and white active duty males from the 1988 ANSUR database*

Age	Variable	Delta[1] Δ=ARNG-AD	*t*-value[2]	z-value[3]
<25	Height (mm)	1.0	-0.15	
	Weight (kg)	2.4		***-1.52**
	Waist Circumference (cm)[4,5]	4.4		*****-5.11**
	BMI (kg/m^2)	0.7		***-1.87**
25-34	Height (mm)	-22.2	****3.37**	
	Weight (kg)	0.9		-0.82
	Waist Circumference (cm)	3.3		*****-3.46**
	BMI (kg/m^2)	1.0		****-2.58**
35-44	Height (mm)	-24.8	*****3.05**	
	Weight (kg)	1.4		***-1.52**
	Waist Circumference (cm)	3.6		*****-3.66**
	BMI (kg/m^2)	1.2		*****-3.60**
45+	Height (mm)	-58.8	***1.98**	
	Weight (kg)	-7.7		***1.39**
	Waist Circumference (cm)	-1.9		0.69
	BMI (kg/m^2)	-0.4		0.43

[1]Deltas between white males from Fort Polk sample and white males from 1988 ANSUR sample adjusted for 15 years of secular change employing Greiner and Gordon's secular trend models (1992). No secular trend model was available for waist circumference so these are unadjusted values.

[2]Stature differences were tested using *t*-tests

[3]Weight, waist circumference and BMI differences tested using Wilcoxon Rank Sum tests

[4]The comparison of waist circumference is between white males from both samples without any adjustment for secular increases, as no secular model was available at the time.

[5]Waist Circumference was measured at Omphalion.

*($p < 0.05$) after Bonferroni correction; **($p < 0.01$) after Bonferroni correction; ***($p < 0.001$) after Bonferroni correction

Relationship to Current Army Standards

The distribution of height-weight ratios and BMI calculations for white male ARNG personnel from Fort Polk, Louisiana during July 2003 in relation to the Army (AR 600-9, 1994) and Department of Defense (DoD Instruction 1308.3, 2002) weight standards are presented in Table 6. Application of the Army weight restriction standards suggests that almost 57% of white males from the Fort Polk sample fall above the acceptable weight-for-height standards and would be required to have body fat calculations conducted (AR 600-9, 1994). In contrast, only about 31% of white male active duty soldiers, as represented by the ANSUR database weighted to match 2002 age/race distributions, fall above the Army's weight-for-height guidelines (see Table 7). Chi-square analysis indicates that the white male personnel from the Fort Polk sample are statistically more likely to fall above the Army's weight standards than their active duty counterparts ($\chi^2 = 170.41, p < 0.001$) (see Table 7).

Employing the Department of Defense's most lenient weight standard (BMI ≤ 27.5), we note approximately 50% of the white male personnel from the Fort Polk sample fall above the maximum allowable BMI (see Table 6); these individuals would be required to have more specific body fat calculations conducted (DoD Instruction 1308.3, 2002). In contrast, only about 22% of white males from the 2002 ANSUR weighted database fall above the DoD's weight standard (see Table 8). Chi-square analysis indicates that white males from the Fort Polk sample are significantly more likely to exceed the BMI standards than their active duty ANSUR counterparts ($\chi^2 = 108.72, p < 0.001$) (see Table 8).

This finding indicates that the white males in the sample from Fort Polk are more likely than their active-duty counterparts to exceed the Army and Department of Defense's weight-for-height regulations and have a more in-depth review of their percent body-fat using circumference-based measurements as required by the Army (AR-600-9, 1994) and the Department of Defense (DoD Instruction 1308.3, 2002). Upon assessment of percent body fat, a large number of these individuals, if in the active-duty forces, would be likely to enter the Army Weight Control Program (AWCP) or risk being separated from the forces.

Table 6. *Distribution of Army weight-for-height ratios and DoD BMI for a white male ARNG sample at Fort Polk, Louisiana, July 2003 in relation to Army and Department of Defense weight-for-height standards*

	Army Ht-Wt Screening Standard		DoD* BMI Cutoff 27.5	
Age	Under *n* (%)	Over *n* (%)	Under *n* (%)	Over *n* (%)
17-20	18 (5.12)	29 (8.26)	25 (7.12)	22 (6.27)
21-27	51 (14.52)	49 (13.96)	65 (18.52)	35 (9.97)
28-39	60 (17.09)	84 (23.93)	64 (18.23)	80 (22.79)
40+	20 (5.69)	40 (12.82)	21 (5.98)	39 (11.11)
Total	**149 (42.45)**	**202 (57.54)**	**175 (49.86)**	**176 (50.14)**

*The screening table here uses the Department of Defense's lenient BMI cutoff of 27.5 before a soldier has a body fat calculation completed.

Table 7. *Chi-square analysis comparing white ARNG males from Fort Polk and white active duty males from ANSUR 2002 for exceeding Army weight-for-height standards*

	Army Ht-Wt Screening Standard		
	Under (%)	**Over (%)**	**Total**
Fort Polk sample 2003	149 (42.45)	202 (57.54)	351
ANSUR 2002	1108 (68.69)	505 (31.31)	1613
Total	**1257**	**707**	**1964**

$\chi^2 = 170.41$ ($p < 0.001$)

Table 8. *Chi-square analysis comparing white ARNG males from Fort Polk and white active duty males from ANSUR 2002 for exceeding Army and DoD weight standards*

	DoD BMI Cutoff 27.5		
	Under (%)	**Over (%)**	**Total**
Fort Polk sample 2003	175 (49.86)	176 (50.14)	351
ANSUR 2002	1247 (77.31)	366 (22.69)	1613
Total	**1415**	**549**	**1964**

$\chi^2 = 108.72$ ($p < 0.001$)

Discussion

On average, white male ARNG personnel measured at Fort Polk, Louisiana during July 2003 ($N = 351$) were shorter and heavier than their active duty counterparts from the 2002 ANSUR database ($N = 1613$), matched for age and adjusted for 15 years of secular increase using the secular trend models developed by Greiner and Gordon (1992).

Results revealed that the height of individuals from the Fort Polk sample decreased over time and was shorter overall than the sample of active duty soldiers from the 2002 ANSUR database, adjusted for secular increases, except in those 25 years or younger. Both weight and BMI values showed increases as individuals aged in both samples, although white males from Fort Polk had larger weight and BMI values than their active duty counterparts. Unfortunately, no secular trend model was available to adjust waist circumference values for the 2002 ANSUR database and so comparison was done between white males of both groups without any adjustment. Results showed an increase in waist circumference as individuals aged, for both samples, with the sample from Fort Polk having larger waists than the sample of active duty soldiers except for the oldest age group.

By limiting this comparison to only white individuals, the sample size remained robust, except for in the oldest age groups. In addition, the use of secular trend models allowed an adjustment to be made that reflects changes in the heights and weights of individuals over the last 15 years. This adjustment provided a stronger comparison by eliminating secular increases as a reason for seeing differences between the groups. However, with this adjustment, changes were estimated over the 15 years and therefore these changes may have overestimated or underestimated certain values. Hence an argument can be made to obtain more recent active duty soldier data for comparison and test to see if the differences found in the analysis remain intact.

Conclusions

This report outlines exploratory research designed to gather anthropometric data on Army National Guard/Reserve personnel for comparison to active duty force members. The current

data, collected primarily from individuals belonging to the 28th Infantry Division of the Pennsylvania Army National Guard, provide the only directly measured data on this component of the forces. The information collected on body size and population background will provide an important basis for comparing all three components of the Army and for the development and fit of protective clothing and equipment.

The data presented to this point indicate that white male ARNG soldiers measured from Fort Polk during July of 2003 are heavier than their active-duty counterparts. In addition, results suggest that the individuals measured from Fort Polk, Louisiana during 2003 were more likely to fall above the Army and DoD weight regulations than the comparative active duty personnel in the 1988 ANSUR database (Gordon et al. 1989), even after secular trend adjustments (Greiner and Gordon, 1992).

The results of this study indicate military clothing and protective equipment designed and sized for active-duty forces may not fit ARNG personnel well because they are, on average, shorter and heavier than current active duty forces. In pursuing the data collection, the authors will in the future study more groups from the Army National Guard and Reserve forces and additional current active duty soldiers to further explore this issue.

This document reports research undertaken at the U.S. Army Soldier and Biological Chemical Command, Soldier Systems Center, Natick, MA, and has been assigned No. NATICK/TR-05/016, in a series of reports approved for publication.

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APPENDIX A

Fort Polk Information

Table A1. *Distribution of males in anthropometric data sample by military units, Fort Polk, Louisiana, 2003**

I. 28th Infantry Division, Pennsylvania ARNG

	Unit	Description	Location	*n*	Subtotal
28th Infantry Division	28th ID	Infantry Division*	Harrisburg*	2	
	628th MIBN	Military Intelligence Battalion*	Harrisburg	2	
	28th Sig HHC	Headquarters H Co Signal Battalion	Coraopolis	16	20
Aviation Brigade	HHC 2/104th AVN	Headquarters H Co General Support Aviation Battalion	Fort Indiantown Gap	3	3
2nd Brigade	Company C 1/110th	Infantry	Waynesburg	42	
	Company C 1/112th	Infantry	Ridgeway	14	56
56th Brigade		Headquarters H Co Brigade		3	
	Company C	(BDE) Headquarters H Co Brigade		14	
	Company B 1/111th	Infantry	West Chester	9	
	Company C 1/111th	Infantry	Kutztown	75	
	Company A 2/112th	Infantry	Huntingdon	29	
	Company B 2/112th	Infantry	Everett	53	
	Company C 2/112th	Infantry	Altoona	51	234
28th Division Support Command	HHC	Division Support Command*	Harrisburg	3	
	Company B 328th	(FSB) Forward Support Battalion	Philadelphia	5	8
213th Area Support Group	282 PSD	Personnel Detachment	Fort Indiantown Gap	3	3

(Continued)

Table A1. *Distribution of male personnel in anthropometric data sample by military units, Fort Polk, Louisiana, 2003** *(Continued)*

	Unit	Description	Location	*n*	Subtotal
28th Division Artillery	HHB 28th Div	Headquarters H Battery- Division Artillery	Hershey	14	14
28th Division Engineering Brigade	HHC 337th	Headquarters H Co	Punxsutawney	1	
	Company B 337th	Engineer Battalion	Reading	15	16
II. State Area Command (STARC)					
	Detachment 4 HQ Training Site	Headquarters State Area Command, Training State Commander	Fort Indiantown Gap, Allentown	1	1
III. Other					
	1137 MP	Military Police**	Kennett, MO	3	
	246th QM Co	Quartermaster Company (Mortuary Affairs)	Puerto Rico	2	
	640th MIBN	Military Intelligence Battalion**	Los Almos California	2 4	
	982nd Signal	Signal Battalion**	Wilson, NC	2	
	Company A 1/131st	Infantry	Bartonville, Illinois	1 0	
	1/131st Avn	Aviation**	Hope Hall, Alabama	1	
	1/151st	Infantry	Salem, Indiana	2	44
Total					399*

* Five individuals did not provide military units for analysis.

TABLE A2: Height/weight survey of Active Duty, Reserve and National Guard components of the U.S. Army

Subject #: _____
Date: _____

(Important please read)
You may wonder why personal questions about your age, sex, race/ethnicity and your parent's race/ethnicity are being asked in a body size study. This information is needed to ensure that study results truly represent the body sizes/shapes of all the different Army age/sex/race groups.

Part A: Individual Questionnaire:

(Please complete the following questions)

Name: _____ **Military Unit** _____

Date of Birth: _____ **Rank/Grade** _____
M/D/Y

Sex: M F (please circle one) **MOS:**

Race: (Please circle one) **Primary** _____ **Secondary** _____

(White) (Black) (Hispanic) (Asian/Pacific Islander)

(Native American) (Mixed – specify below) (Other- specify below)

_____

Height (without shoes): _____feet _____inches

Weight (without clothes): _____pounds

(Continued)

TABLE A2. Height/Weight Survey of Active Duty, Reserve and National Guard components of the U.S. Army *(Continued)*

Part B: Interviewer Questions:

Subject's Ethnicity: _____

Mother's Race _____ **Mother's Ethnicity** _____

Father's Race _____ **Father's Ethnicity** _____

Measurements

Height (mm) _____

Weight (kg) _____

Waist Circumference (mm) _____

T-Shirt size _____

BDU Trouser Size/Length _____
(eg. Medium/Long)

BDU Coat Size/Length _____
(eg. Medium/Long)

TABLE A3. MOS descriptions for sample measured at Fort Polk, Louisiana, July 2003

Unit	No.	Description	Rank
INFANTRY			
11A (branch 11)	15	Infantry	O
11B	234	Infantryman	E
11C	9	Indirect Fire Infantryman	E
11H	1	Heavy Anti-Armor Weapons Infantryman	E
11Z	2	Infantry Senior Sergeant	E
COMBAT ENGINEERING			
12A (branch 12)	2	Armor	O
12B	17	Combat Engineer	E
FIELD ARTILLERY			
13A (branch 13)	6	Field Artillery	O
13B	1	Cannon Crewmember	E
13C	1	Tactical Automated Fire Control Systems	E
13F	7	Fire Support Specialist	E
13Z	1	Field Artillery Senior Sergeant	E
AIR DEFENSE			
14B (branch 14)	1	Air Defense Artillery	O
HELICOPTER PILOT			
153D	6	UH-60 Pilot (helicopter)	WO
153DF	1	UH-60 Pilot (helicopter) F?	WO
153DO	1	UH-60 Pilot (helicopter) O?	WO
AVIATION			
15A (Branch 15)	2	Aviation	O
15B (Branch 15)	1	Aviation	O
ARMOR			
19D	10	Cavalry Scout	E
CORPS OF ENGINEERS			
21B (Branch 21)	1	Corps of Engineers	O
VISUAL INFORMATION			
25A (Branch 25)	1	Signal Corps	O
25C (Branch 25)	1	Signal Corps	O
25V	2	Combat Documentation/Production Specialist	E
MISSILES SYSTEM MAINTENANCE			
27D	3		E
27E	2	Land Combat Electronic Missile System Repairer	E
SIGNALS (COMMUNICATION)			
31C	2	Radio Operator-Maintainer	E
31R	1	Multi-channel Transmission Systems Operator-Maintainer	E
31U	4	Signal Support Systems Specialist	E
31W	1	Telecommunications Operations Chief	E

(Continued)

TABLE A3. MOS descriptions for sample measured at Fort Polk, Louisiana, July 2003
(Cont'd)

Unit	No.	Description	Rank
MILITARY INTELLIGENCE			
350B	1	All Source Intelligence Technician	WO
ELECTRONIC MAINTENANCE			
35D	10	Air Traffic control Equipment Repairer	E
35E	2	Radio and Communications Security	E
35P (Branch 35)	1	Military Intelligence Corps	O
ARMAMENT MAINTENANCE			
45G	1	Fire Control Repairer	E
CHEMICAL OPERATIONS			
54B	3	Chemical Operations Specialist	E
AMMUNITION			
55A (Branch 55)	1	Judge Advocates General's Corps	O
55B	1	Ammunition Specialist	E
CHAPLAINS ASSISTANT			
56A (Branch 56)	3	Chaplain's Corps	O
56M	1	Chaplain's Assistant	E
CONSTRUCTION EQUIPMENT			
62E	1	Heavy Construction Equipment Operator	E
62N	1	Construction Equipment Supervisor	E
MECHANICAL MAINTENANCE (VEHICLES)			
63B	1	Light-Wheel Vehicle Mechanic	E
63H	2	Track Vehicle Repairer	E
63T	2	Bradley Fighting Vehicle System Mechanic	E
63W	1	Wheel Vehicle Repairer	E
63Y	1	Track Vehicle Mechanic	E
AIRCRAFT MAINTENANCE			
67R	2	Attack Helicopter Repairer	E
67T	6	Helicopter Repairer	E

(Continued)

TABLE A3. MOS descriptions for sample measured at Fort Polk, Louisiana, July 2003 *(Continued)*

Unit	No.	Description	Rank
ADMINISTRATION			
71L	1	Administrative Specialist	E
INFORMATION SYSTEMS			
74A (Branch 74)	1	Chemical Corps	O
74B	2	Information Systems Operator-Analyst	E
PERSONNEL			
75B	2	Personnel Administrative Specialist	E
75H	5	Personnel Services Specialist	E
FUELS AND WATER			
77F	1	Petroleum Supply Specialist	E
TRANSPORTATION			
88 (Branch 88)	1	Transportation Corps	O
MEDICAL			
91B	1	Medical Specialist	E
91W	16	Health Care Specialist	E
LOGISTICS			
92A	3	Automated Logistical Specialist	E
92M	2	Mortuary Affairs Specialist	E
92Y	3	Unit Supply Specialist	E
LAW ENFORCEMENT			
95B	3	Military Police	E
INTELLIGENCE			
96B	12	Intelligence Analyst	E
96D	1	Imagery Analyst	E
96R	1	Ground Surveillance	E
96Z	1	Intelligence Senior Sergeant	E
COUNTER/HUMAN INTELLIGENCE			
97B	2	Counterintelligence Agent	E
97E	1	Interrogator	E
97L	1	Translator/Interpreter	E
SIGNALS (COMMUNICATIONS)			
98C	3	Signals Intelligence Analyst	E
98G	1	Voice Interceptor	E
QUARTERMASTER			
QM	1	Quartermaster	O

Table A4. *U. S. Army BDU Trouser Weights (grams), Fort Devens (MC), October 2003*

	SIZE	XXS	XS	S	R	L	XL	XXL
Temperate Trouser	**XS**			673				
	S		679	740	749	799		
	M		708	765	766	782	810	
	L			785	781	803	833	
	XL			809	839			
	XXL							925
Warm Weather Trouser	**XS**			644	650			
	S			700	693	710		
	M		683	712	718	754		
	L			751	751	799	807	
	XL			750	766	784		
	XXL							890

*Empty cells reflect clothing items that were unavailable at the of time data collection

Table A5. *U.S. Army T-shirt and sock weights (grams), Fort Devens (MC), October 2003**

	Size	Weight 1	Note
T-shirts	**XS**	107	
	S	96	
	M	143	3 pak/3
	L		
	XL	184	
	XXL		
	XXXL		
Socks	**S**		
	M	46.1	
	L	48	3 pak/3
	XL	48	3 pak/3

*Empty cells reflect clothing items that were available at the time of data collection

Table A6. *Distribution of anthropometric data for males from the ARNG sample, Fort Polk, Louisiana, 2003*

Age	Race	*n*	%	Variable	Min	Mean	*SD*	Max
<25	white	109	88.6	Stature (mm)	1640.0	1771.2	60.97	1942.0
				Weight (kg)	57.4	82.9	12.48	117.2
				Waist Circumference (cm)[1]	71.5	887.8	87.56	110.0
				BMI (kg/m^2)	19.1	26.4	3.47	33.73
	black	3	2.4	Stature (mm)	1790.0	1821.3	28.02	1844.0
				Weight (kg)	80.6	92.1	11.08	102.7
				Waist Circumference (cm)[1]	81.0	891.7	75.88	96.0
				BMI (kg/m^2)	25.2	27.7	2.77	30.7
	hispanic	5	4.1	Stature (mm)	1632.0	1734.2	77.63	1814.0
				Weight (kg)	68.6	76.0	6.98	87.4
				Waist Circumference (cm)[1]	76.1	821.4	85.27	95.5
				BMI (kg/m^2)	22.4	25.4	3.27	29.3
	asian/pi	2	1.6	Stature (mm)	1660.0	1686.5	37.48	1713.0
				Weight (kg)	61.6	63.8	3.15	666.0
				Waist Circumference (cm)[1]	73.9	77.7	53.74	81.5
				BMI (kg/m^2)	22.0	22.5	2.10	23.9
	Other	4	3.25	Stature (mm)	1768.0	1794.5	28.52	1835.0
				Weight (kg)	77.5	93.2	14.75	106.1
				Waist Circumference (cm)[1]	82.0	93.3	13.64	110.5
				BMI (kg/m^2)	24.4	28.9	4.44	33.8
	Subtotal	123	30.4					
25-34	white	116	82.8	Stature (mm)	1600.0	1757.5	64.75	1898.0
				Weight (kg)	56.0	84.7	12.36	124.3
				Waist Circumference (cm)[1]	72.0	91.5	92.5	125.0
				BMI (kg/m^2)	20.1	27.4	3.67	39.8
	black	7	5.0	Stature (mm)	1662.0	1741.7	52.46	1829.0
				Weight (kg)	68.7	83.5	11.61	101.8
				Waist Circumference (cm)[1]	79.0	89.0	84.36	102.7
				BMI (kg/m^2)	22.3	27.6	4.26	35.3
	hispanic	9	6.4	Stature (mm)	1596.0	1697.0	99.40	1885.0
				Weight (kg)	60.4	75.0	9.01	86.2
				Waist Circumference (cm)[1]	73.0	86.2	82.35	100.3
				BMI (kg/m^2)	21.4	26.1	2.67	29.3
	asian/pi	4	2.8	Stature (mm)	1701.0	1763.5	52.70	1828.0
				Weight (kg)	63.0	71.2	5.86	76.4
				Waist Circumference (cm)[1]	79.8	80.8	17.36	83.4
				BMI (kg/m^2)	18.9	23.0	2.93	25.7
	Other	4	2.8	Stature (mm)	1543.0	1705.5	129.17	1820
				Weight (kg)	55.3	81.7	22.92	102.2
				Waist Circumference (cm)[1]	74.6	87.9	15.26	103.5
				BMI (kg/m^2)	23.2	27.5	3.94	31.6
	Subtotal	140						

Continued

Table A6. *Distribution of anthropometric data for males from the ARNG sample, Fort Polk, Louisiana, 2003 (continued)*

Age	Race	*n*	%	Variable	Min	Mean	*SD*	Max
35-44	white	97	88.2	Stature (mm)	1570.0	1747.5	72.80	1945.0
				Weight (kg)	55.9	87.5	11.64	114.4
				Waist Circumference (cm)[1]	74.0	95.9	87.52	116.0
				BMI (kg/m^2)	18.7	28.7	3.43	35.6
	black	5	4.5	Stature (mm)	1663.0	1723.3	36.07	1755.0
				Weight (kg)	68.1	79.7	6.92	86.0
				Waist Circumference (cm)[1]	70.5	85.4	84.37	90.5
				BMI (kg/m^2)	22.1	26.9	3.09	30.3
	hispanic	5	4.5	Stature (mm)	1622.0	1693.0	44.18	1740.0
				Weight (kg)	89.4	94.6	6.88	106.5
				Waist Circumference (cm)[1]	89.5	101.8	76.69	108.7
				BMI (kg/m^2)	30.9	33.0	2.21	35.6
	asian/pi	2	1.8	Stature (mm)	1721.0	1748.0	38.18	1775.0
				Weight (kg)	80.1	86.4	8.90	92.7
				Waist Circumference (cm)[1]	81.3	88.2	98.29	95.2
				BMI (kg/m^2)	25.4	28.4	4.15	31.3
	Other	1	0.9	Stature (mm)	1700.0	1700.0	0.00	1700.0
				Weight (kg)	95.1	95.1	0.00	95.1
				Waist Circumference (cm)[1]	100.0	100.0	0.00	100.0
				BMI (kg/m^2)	32.9	32.9	0.00	32.9
	Subtotal	110	27.2					
45+	white	29	93.5	Stature (mm)	1574.0	1722.4	79.42	1860.0
				Weight (kg)	64.5	84.6	10.30	112.7
				Waist Circumference (cm)[1]	80.5	95.2	67.16	107.0
				BMI (kg/m^2)	23.8	28.5	2.17	32.6
	black	1	3.2	Stature (mm)	1890.0	1890.0	0.00	1890.0
				Weight (kg)	92.7	92.7	0.00	92.7
				Waist Circumference (cm)[1]	86.0	86.0	0.00	86.0
				BMI (kg/m^2)	25.9	25.9	0.00	25.9
	hispanic	1	3.2	Stature (mm)	1635.0	1635.0	0.00	1635.0
				Weight (kg)	91.3	91.3	0.00	91.3
				Waist Circumference (cm)[1]	102.0	102.0	0.00	102.0
				BMI (kg/m^2)	34.2	34.2	0.00	34.2
	asian/pi	0	0	Stature (mm)				
				Weight (kg)				
				Waist Circumference (cm)[1]				
				BMI (kg/m^2)				
	Other	0	0	Stature (mm)				
				Weight (kg)				
				Waist Circumference (cm)[1]				
				BMI (kg/m^2)				
	Subtotal	31	(7.7)					
	Total	**404**						

APPENDIX B

Description of Original Database Variable Names and Descriptions

Table B1. *Description of original database information provided by ANTHROTECH, Yellow Springs, Ohio*

Variable Name	Description	Value	Label
SUBJECT	Subject Number		
DATE	Measuring Date		
MILUNIT	Military Unit		
BDATE	Date of Birth		
AGE	Age, calculated		
AGE1	Age, truncated to whole year		
ENLOFF	Enlisted/Officer	1	Enlisted
		2	Officer
RANK	Rank		
GRADE	Grade		
SEX	Sex	1	Male
		2	Female
DUTY	Type of Duty	1	Active Duty
		2	Reserve
		3	National Guard
PRIMJOB1	Primary Job 1		
PRIMJOB2	Primary Job 2		
SECJOB1	Secondary Job 1		
SECJOB2	Secondary Job 2		
RACE	Race	1	White
		2	Black
		3	Hispanic
		4	Asian/Pacific Islander
		5	Native American
		6	Mixed
		7	Other
RACEOTHR	Race Other Description		
MOTHRACE	Mother's Race	1	White
		2	Black
		3	Hispanic
		4	Asian/Pacific Islander
		5	Native American
		6	Mixed
		7	Other
FATHRACE	Father's Race	1	White
		2	Black
		3	Hispanic
		4	Asian/Pacific Islander
		5	Native American
		6	Mixed
		7	Other
SUBJETH1	Subject's Ethnicity - Original		
MOTHETH1	Mother's Ethnicity - Original		
FATHETH1	Father's Ethnicity - Original		
SUBJETH2	Subject's Ethnicity- Reorganized		
MOTHETH2	Mother's Ethnicity - Reorganized		
FATHETH2	Father's Ethnicity - Reorganized		
REPHTFT	Reported Feet of Height		

(continued)

Table B1. *Description of original database information provided by ANTHROTECH, Yellow Springs, Ohio (Continued)*

Variable Name	Description	Value	Label
REPHTIN	Reported Inches of Height		
RTOTHTIN	Reported Total Height, Inches		
HTMMIN	Measured Height Converted to Inches		
HTDELTA	Reported Height minus Measured Height		
WEIGHTLB	Reported Weight in Pounds		
WGTKGLB	Measured Weight Converted to pounds		
TSHIRT	T-Shirt Size		
PANTSIZE BDU	Trouser Size (alphanumeric)		
PANTLGTH BDU	Trouser Length (alphanumeric)		
BDUTRS	BDU Trouser	1	XS/R
		2	S/XS
		3	S/S
		4	S/R
		5	S/L
		6	M/XS
		7	M/S
		8	M/R
		9	M/L
		10	L/XS
		11	L/S
		12	L/R
		13	L/L
		14	L/XL
		15	XL/R
		16	XL/L
COATSIZE	Bdu Coat Size (alphanumeric)		
COATLGTH	Bdu Coat Length (alphanumeric)		
BDUCOAT	Bdu Coat	1	XS/R
		2	S/XS
		3	S/S
		4	S/R
		5	S/L
		6	M/XS
		7	M/S
		8	M/R
		9	M/L
		10	L/XS
		11	L/S
		12	L/R
		13	L/L
		14	L/XL
		15	XL/R
		16	XL/L

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APPENDIX C

Initial Data Screening by ANTHROTECH for ARNG, Fort Polk, Louisiana, July 2003

APPENDIX C

Initial data screening by ANTHROTECH for ARNG, Fort Polk, Louisiana, July 2003

Additional information:

The following discrepancies were found when checking reported height with measured height:

#1200 Reported = 6' 8"; Measured = 5' 8 ½"
#1275 Reported = 6' 11"; Measured = 5' 10"
#1036 Reported = 6' 9"; Measured = 5' 7 ½"
#1016 Reported = 7' 2"; Measured = 6' ½"

We suspect that the subjects' thought they were reporting in inches and therefore, the 'feet' part of the measurement is incorrect and should be 5, 5, 5, and 6 respectively. No changes were made.

Missing data are blank in the data set.

Sometimes, either the rank or grade was missing. Even though there is a very close correspondence between the two, it is not always exact, so we did not fill in the missing values.

Sometimes, the date of birth was entered with a "2003" year. In these cases, we could not calculate an accurate age, so age was left blank.

Editing:

No editing was done for females – there were only 6.
One subject in the male data set was flagged for Waist Circ but a change in the value was not warranted.
One other subject had the weight and height reversed. We changed the data file, and made the notation on the data sheet.

Ethnicity:

The original data represents an exact typing of what was recorded on the data sheet. The reorganized variables represent an attempt to make the designations consistent, e.g. 'german-italian' and 'italian-german' became 'german-italian'. British and English were combined to become British, and so on.